

EXHIBIT 2

ORIGINAL

MISSOURI CIRCUIT COURT

TWENTY-FIRST JUDICIAL CIRCUIT

ST. LOUIS COUNTY

-----X

LIVINGSTON HAMPTON, et al.,

Plaintiffs,

vs.

MONSANTO CO., et al.,

Defendants.

Case No. 10SL-CC03428

-----X

630 Third Avenue
New York, New York

December 13, 2011
9:00 a.m.

Videotaped Deposition of DAVID ROSNER,
before Shari Cohen, a Notary Public of the State of
New York.

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1 different kinds of issues that were raised in our
2 chronology.

3 Q. So these documents are all either letters
4 or memos or other documents that are listed in the
5 chronology?

6 A. That's right.

7 Q. You are not an expert in the historical
8 developments or the evolution of analytical chemistry
9 as a science, are you?

10 A. No, I have studied at different moments
11 aspects of the history of chemistry and history of
12 chemistry in industry, but I would not consider myself
13 an expert on the science of evolution of chemical
14 ideas.

15 Q. Your resume lists over 40 books or
16 portions of books that you have written?

17 A. Well, we've written I guess 10 or 11
18 books and many, many articles, but not 40 books I
19 don't think.

20 Q. My question was that your resume lists
21 over 40 books or portions of books that you have
22 written?

23 A. You mean like edited collections and
24 articles in edited collections I guess so. I haven't
25 counted them, but that might be true, chapters in

1 need to substantially reduce what we have now?

2 **A. That's right.**

3 Q. And do you have a view that at least in
4 part you can assist in reversing that by being an
5 expert witness in environmental cases and cases where
6 there are injured people?

7 MR. JENSEN: Objection to form.

8 **A. I'm not quite sure what the question is.**
9 **Do I -- say that again.**

10 Q. Let me ask it more openly. Do you see
11 any role that you can play as an expert witness that
12 might counter what's going on with the decapitating of
13 these agencies like OSHA and EPA?

14 MR. JENSEN: Objection to form.

15 **A. I don't see my role necessarily in**
16 **relationship to OSHA and EPA. I see my role as a**
17 **citizen, someone who's been involved in public health**
18 **for 30 years as a professor of public health and who**
19 **is concerned about the health of the American public**
20 **and who sees the court cases as an important arena**
21 **within which Americans can try to control their**
22 **environment and which I as someone who has a certain**
23 **kind of expertise have an obligation almost to**
24 **participate.**

25 Q. Let's switch gears. Do you agree that

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1 PCBs "durability and resistance to fire made PCBs
2 excellent dielectric fluids for use in high
3 temperature electrical transformers"?

4 A. This again is what the industry said
5 historically going back to the 1950s and forties. I'm
6 not an electrical engineer. I cannot judge that. I
7 cannot say that this is absolutely the reason why they
8 are adapted, I just don't know.

9 Q. Do you recall preparing an Affidavit in
10 this case?

11 A. Yes.

12 MR. CARNEY: Mark this as Defendant's
13 Exhibit 8.

14 (Defendant's Exhibit 8, Affidavit,
15 marked for Identification.)

16 Q. Do you recognize that as an Affidavit you
17 prepared in this case?

18 A. Yes.

19 MR. JENSEN: I just want the record to be
20 clear that what I think is happening is that we
21 are numbering consecutively from yesterday's
22 deposition of Dr. Markowitz for purposes of
23 this deposition today?

24 MR. CARNEY: Yes. Some of them overlap.

25 MR. JENSEN: That's fine. I think it

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1 workers throughout the United States?

2 MR. JENSEN: Objection to form.

3 A. During what period of time?

4 Q. Over the last 30 or 40 years?

5 A. Since the 1970s, eighties, seventies and
6 eighties?

7 Q. Yes.

8 A. I'm sure there have been. I haven't
9 followed those.

10 Q. Are you aware of any -- let me ask you
11 this. What would be the value of studying workers
12 such as PCB workers who were exposed to the product
13 day in and day out for decade?

14 A. What would be the value if there were any
15 obvious unpredictable occurrences of disease you could
16 tell whether or not workers were being put in danger.

17 Q. Are you aware of any such epidemiology
18 studies among the dozens or so studies that have
19 studied PCB workers where they have concluded that
20 PCBs were causing any kind of adverse health impacts?

21 MR. JENSEN: Objection to form and
22 foundation.

23 A. Again, that's really outside my
24 expertise. I'm really not following that epidemiology
25 in the recent decades, I just haven't done it.

1 a problem here until we are forced to acknowledge it.

2 Q. But my question is you are not able to
3 say one way or another whether slightly tumorigenic was
4 a more accurate description or less accurate
5 description than does not appear to be carcinogenic
6 with regard to the IBT studies?

7 A. Well, you know, again, I think you have
8 to take it at face value. If they are the same thing,
9 if they were not trying to change the results, then
10 all they are doing is finding a different way that
11 seems to be less problematic of stating them and
12 either they are trying to get IBT to change its
13 results which is one thing which I hope they weren't
14 trying to do or alternatively they were trying to find
15 a less damaging way of talking about what IBT was
16 observing.

17 Q. You have not reviewed the actual
18 pathology of the IBT studies?

19 A. No, I haven't.

20 Q. You are not able to say that Monsanto was
21 trying to change the IBT conclusion from slightly
22 tumorigenic to does not appear to be carcinogenic in an
23 improper way?

24 MR. JENSEN: Objection to form.

25 A. I always think it's improper for an

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1 industry to change the wording of people who are
2 trying to do an evaluation of research. I think it is
3 improper.

4 Q. Even if the change is more accurate?

5 A. You know, again, that's going to have to
6 be left to pathologists to battle over, but this is
7 the way that that organization saw it stated and
8 unless there is absolutely clear reason to change it
9 from other pathologists I don't quite get why would
10 they be told to do this. I don't know who was telling
11 them. I don't really recall. If you could show me the
12 place where we see that because it would be
13 interesting to see whether pathologists were telling
14 other pathologists or whether it was somebody in the
15 administration of Monsanto that was suggesting this.
16 What year is that?

17 Q. I believe it was 1972 or '73, but my
18 question is really a simple one and that is you don't
19 know which term is more accurate to describe what was
20 being shown in the IBT studies and that is the PCBs
21 were slightly tumorigenic or that "it does not appear
22 to be carcinogenic", you don't know which one is more
23 accurate?

24 MR. JENSEN: Objection to form.

25 A. I would tend to stick with the scientists

1 MR. JENSEN: Objection to form.

2 A. Again, I'm not a pathologist. I would
3 have to leave that to pathologists to answer. I don't
4 know.

5 Q. It's possible for a substance to be or is
6 it possible for a substance to be tumorigenic, but not
7 carcinogenic?

8 A. I think in the 1970s there was actually a
9 debate about what those terms meant about what
10 carcinogenic and tumorigenic were and that's just a
11 historical debate. Obviously carcinogenic is a more
12 severe form of tumorigenic. Carcinogenic is pretty
13 much a cancer and tumorigenic may indicate a benign
14 growth or it may indicate a cancer.

15 Q. Isn't the first indication from your
16 document review of the Monsanto documents that they
17 should have done earlier chronic testing of PCBs in a
18 December 19, 1977 radio interview where the Monsanto
19 president says, "Now it turned out that we didn't know
20 as much as we should and you can criticize the
21 company, the company can be criticized for its
22 scientific voids, but it acted in a very responsible
23 manner based on the information that it had"?

24 MR. JENSEN: Objection to form.

25 A. What's the question?

1 A. We know that it has an affect on us in
2 the sense that since we got rid of it the bald eagle
3 is back. Since we got rid of it all sorts of animal
4 life has begun -- has come back. That the absence of
5 this material has certainly had an impact on us. That
6 the fish kills in Lake Michigan or other places are
7 not necessarily, you know, happening quite the
8 regularity or Lake Erie is no longer a dead lake. We
9 have indirect evidence of he fact that at least in the
10 United States getting rid of DDT was quite beneficial
11 to the society and to human beings.

12 There are arguments and I think there can
13 be valid arguments about Africa and South America and
14 other areas where malaria is really prevalent, but I
15 don't think many people would argue that getting rid
16 of DDT has been harmful to human beings in the United
17 States. I think most people would agree that we've
18 lived very well without it.

19 Q. I understand getting rid of DDT has been
20 helpful to the bald eagle and certain other animals,
21 but that's one example that you gave. My question
22 really is are you aware of whether there is any
23 adverse impact on man through the daily absorption of
24 small amounts of DDT from food, water and air?

25 A. It's really outside my province. I think

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1 that epidemiologists have discussed that and there is
2 a lot of people that think that DDT has been a problem
3 and I cannot evaluate that argument. I think that
4 it's certainly been beneficial to human beings in the
5 sense that our environment and our children are not
6 being exposed to a chlorinated hydrocarbon that's
7 persistent and that is potentially a danger, it's a
8 danger to other forms of life. I'm not sure why it
9 would not potentially be a danger to us as well so I
10 don't see any down side to having limited it at all,
11 in fact a lot of upsides.

12 Q. I recognize the up sides. I take it, I
13 think you said this, but I want to make sure I
14 understood it right that it's very difficult to prove
15 with a compound like DDT that's everywhere and
16 everybody has been exposed to it whether it harms
17 human beings or not; is that accurate?

18 MR. JENSEN: Objection to form.

19 A. Well, I mean it's something that has to
20 be paid attention to and it should be paid attention
21 to and there should be studies and I'm sure that there
22 are studies that show danger. It's not something you
23 can just make a statement like this regarding this.
24 This is persistent chronic exposure to a chemical
25 that's known to be biologically -- to have biological

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1 C E R T I F I C A T E

2

3 STATE OF NEW YORK)

4) ss.:

5 COUNTY OF NEW YORK)

6

7 I, SHARI COHEN, a Notary Public within
8 and for the State of New York, do hereby certify:

9 That DAVID ROSNER, the witness whose
10 deposition is hereinbefore set forth, was duly sworn
11 by me and that such deposition is a true record of the
12 testimony given by such witness.

13 I further certify that I am not related
14 to any of the parties to this action by blood or
15 marriage; and that I am in no way interested in the
16 outcome of this matter.

17 IN WITNESS WHEREOF, I have hereunto set
18 my hand this 21st day of December, 2011.

19

20

21

22

23

24

25 SHARI COHEN

EXHIBIT 3

SUPERIOR COURT OF THE STATE OF CALIFORNIA
FOR THE COUNTY OF LOS ANGELES

-----X
JACQUELINE SMITH; VIRGINIA PIERCE; and
MARK RAMETTA,

Plaintiffs,

-against- Case No. BC 459771

MONSANTO CO.; SOLUTIA, INC.; PHARMACIA
CORP.; PFIZER, INC.; SOUTHERN CALIFORNIA
GAS CO.; and DOES 1-350 Inclusive,

Defendants.

-----X
AND RELATED CASES
-----X

340 Madison Avenue
New York, New York

January 4, 2013
9:00 a.m.

Videotaped Deposition of DAVID
ROSNER, before Shari Cohen, a Notary Public
of the State of New York.

1 Q. The type of information that historians
2 rely upon are documents which we've talked about?

3 A. Yes.

4 Q. They also rely upon conversations with
5 people involved in events if they can talk to them?

6 A. Sometimes if it's relevant, if not, it's
7 not relevant.

8 Q. What if the documents don't provide all
9 the information needed as to whether an event occurred
10 in the past?

11 MR. FRIELING: Objection to form.

12 A. Just as with any science or social
13 science if evidence is not there and information is
14 not there, you try to make informed decisions based on
15 other evidence.

16 Q. Based on other evidence?

17 A. Yeah.

18 Q. Such as?

19 A. Other documents, other statements, other
20 reports, other materials, other events that happened.
21 I'm not quite sure what you're trying to get at.

22 Q. You've answered my question. I
23 appreciate that. It's improper for historians to
24 speak to what was in the mind of an author of a
25 document, correct?

1 MR. FRIELING: Objection to form.

2 A. If the author has written down what was
3 in their mind, you can write about it and you can
4 speak about it, but of course historians are not
5 futurists or not mind tellers, mind readers and of
6 course you cannot be in the mind of an actor, you have
7 no idea what various factors are operating. If they
8 wrote it down, you have a good sense of what was going
9 on in that person's mind.

10 Q. In that vein, if the author of a document
11 was silent about her or his intentions, then it's not
12 up to the historian to assume or suppose what those
13 intentions might be, correct?

14 MR. FRIELING: Objection to form.

15 A. Again, it depends on the circumstance.
16 It depends on the actor, their position in the
17 historical moment and historical context. What was in
18 their mind may or may not be relevant to anything. I
19 don't know.

20 Q. My point was not whether or not it was
21 relevant or not. It's not up to the historian to put
22 themselves in the author's position to determine what
23 the author's intentions were granted if those
24 intentions are not written in the document?

25 MR. FRIELING: Objection to form.

1 to cause historically chloracne, liver damage,
2 pathological change in the liver, changes in blood.
3 Whatever they are, these are materials that have an
4 effect on the biology of human beings and animals and
5 I think that Monsanto would not disagree with that,
6 would they?

7 Q. Therefore, Doctor, do you have the
8 opinion that PCBs are toxic?

9 A. Yes, I think they are toxic.

10 Q. Can you name any substance that is not
11 toxic?

12 A. You can be buried by salt. You could be
13 killed by sugar. You could be hit over the head by a
14 loaf of bread. There are many -- that's such a
15 general question. Everything in the world could be
16 considered toxic in some level.

17 Q. Can you name any chemical that is not
18 toxic?

19 A. Again, I'm not a chemist. I don't know
20 how to define that for different people, but certainly
21 we live in a world in which we are assuming I hope
22 that most of the chemicals we come in contact with I
23 hope that's the case otherwise we are really in
24 trouble are not toxic.

25 Q. Is aspirin a chemical?

1 MR. FRIELING: Objection to form.

2 A. I'm saying --

3 MR. FRIELING: Argumentative.

4 A. They were not looking at the issue. They
5 were not finding problems and didn't look for
6 problems.

7 Q. What issue should they have been looking
8 for?

9 A. Whether or not this material was
10 potentially a danger after long term exposure of
11 populations. This is the issue that they define in
12 1937 as a possible problem that PCBs, diphenyls,
13 chlorinated diphenyls at the time were that chronic
14 exposures at unknown levels at low levels of exposure
15 were potentially a hazard. That's what they say.

16 Q. What should they have done, sir, if that
17 was an identified issue? What are you saying that
18 Monsanto didn't do?

19 A. We've gone over this in two previous
20 depositions. It goes over and over again. I refer to
21 that, but I'm not a biochemist, I'm not a
22 toxicologist, I'm not an industrial engineer, I'm not
23 an industrial mechanic. All I can say is that people
24 were doing long term studies of animals, they were
25 doing toxicological studies for long periods of time,

1 there were PCBs identified in animals in the
2 environment?

3 MR. FRIELING: Objection to form.

4 Q. I think that's what I asked. If not,
5 that's what I'm asking now.

6 A. Article on persistent chlorinated
7 hydrocarbons just talks about hydrocarbons as a class
8 and that's what was a concern at the time and PCBs are
9 part of that class.

10 Q. DDTs would be part of that class?

11 A. Absolutely.

12 Q. Tell me the difference between DDT and
13 PCB?

14 A. I could not. I'm not a chemist. I would
15 not know. All I know is that they were being lumped
16 together as one class of chemicals.

17 Q. Lumped together where?

18 A. In the literature that talked about
19 chlorinated hydrocarbons.

20 Q. You could not tell me how they are
21 similar or different?

22 A. No, I have no idea of the chemistry.
23 That's for a chemist to talk about.

24 Q. Are there different risks or dangers?

25 A. You know, again, I really don't know.

1 diligent about minor problems. They were saying they
2 were trying to make their products safe and they were
3 going to make sure that before it reached the consumer
4 it would be a safe product and people would have the
5 proper information and people would know and people
6 would be aware of how to use it and all the rest.

7 Q. Each company created that standard and
8 they did what they felt was appropriate for that
9 standard whether it included chronic animal testing or
10 not?

11 MR. FRIELING: Objection to form.

12 A. I cannot read their mind. I don't know
13 what Monsanto was thinking. Were they thinking that
14 all this evidence coming out about the chronicity of
15 disease and PCBs as a chronic problem was not worth
16 investigating further because it had the word chronic
17 in it. No, I think they were saying we will make sure
18 our product is safe and we know and we talked about in
19 the past chronic exposures being a possible hazard and
20 we should be following up on that.

21 Q. Where does it say we should be following
22 up on that?

23 A. Their mission statement was to make sure
24 they were putting out a safe product and if you are
25 going to test and you are going to make sure your

1 C E R T I F I C A T E

2

3 STATE OF NEW YORK)

4) ss.:

5 COUNTY OF NEW YORK)

6

7 I, SHARI COHEN, a Notary Public within
8 and for the State of New York, do hereby certify:

9 That DAVID ROSNER, the witness whose
10 deposition is hereinbefore set forth, was duly sworn
11 by me and that such deposition is a true record of the
12 testimony given by such witness.

13 I further certify that I am not related
14 to any of the parties to this action by blood or
15 marriage; and that I am in no way interested in the
16 outcome of this matter.

17 IN WITNESS WHEREOF, I have hereunto set
18 my hand this 14th day of January, 2013.

19

20

21

22

23

24 _____
SHARI COHEN

25

EXHIBIT 4

IN THE CIRCUIT COURT OF THE COUNTY OF ST. LOUIS
TWENTY-FIRST JUDICIAL CIRCUIT
BEFORE THE HONORABLE STEVEN H. GOLDMAN

SYDELL DUBLIN, et al.,)
)
Plaintiffs,)
) Cause No. 10SL-CC03822
vs.)
) Division 12
MONSANTO CO., et al.,)
)
Defendants.)

=====

REPORTER'S TRANSCRIPT OF PROCEEDINGS

VOLUME 7

JUNE 16, 2015

Session C

Cont. of Cross-Examination of Dr. Rosner

Reported by: Alicia A. Carter, RPR, CCR

=====

For the Plaintiff:
Allen Stewart, P.C.
Mr. Allen Stewart
Mr. Scott R. Frieling
Mr. Steve Baughman Jensen

Williams, Kherkher
Mr. Steven J. Kherkher

For the Defendants:
White & Williams
Mr. Thomas M. Goutman

Husch Blackwell
Ms. Robyn D. Buck
Mr. Adam Miller

<p>1 (The following proceedings were held in the 2 courtroom outside the presence of the jury.) 3 THE COURT: So, first of all, about this 4 sniping with each other, you guys are all 5 professionals. And you're all good lawyers. And I 6 don't pretend to try and make you like each other or 7 get along with each other, but when we're here in the 8 courtroom, there just can't be anymore cross-sniping at 9 each other. I'm just not going to allow that. I know 10 you guys can abide by that. So that's that. 11 And then the next thing is the book. So I 12 went over the book and the excerpts that were -- that 13 the plaintiff wants to use, as well as other parts of 14 the book. 15 I'm going to find that although the book, I'm 16 sure is authoritative for the research base of it, that 17 part about what happened in the book, the dates and 18 all, but it's just -- I'm not going to find that -- 19 It's historically correct, I assume, but I'm not going 20 to allow it to be used to impeach as a learned treatise 21 because I read a lot of the book over the lunch hour. 22 It's really a political -- politically stated, whether 23 it's true or not. It could be true. But it's 24 politically a statement as opposed to an authoritative, 25 neutral type source. And let's see the rest of my</p> <p style="text-align: center;">1363</p>	<p>1 that, and I'm trying to give you both a lot of leeway 2 because of that. You guys know the case so much better 3 than I do. This case is so much more involved than a 4 typical case, maybe not for you guys. I'm not going to 5 allow it as a learned treatise. 6 MR. KHERKHER: Yes, sir. 7 THE COURT: I'm not saying you can't impeach 8 people with other stuff. 9 MR. GOUTMAN: I was just going to suggest, 10 this witness has to catch a plane. Rather than argue a 11 document that won't be in front of the Court until next 12 week or the week after -- 13 THE COURT: Would you prefer that, doctor, to 14 rather than -- You have to come back anyway, so... 15 DR. ROSNER: It sounds like I'm going to have 16 to come back anyway. I'll figure that out with you, 17 Judge. 18 THE COURT: So, the defense, you think your 19 cross, you're not going to get done with him this 20 afternoon? 21 MR. MILLER: There's a chance, but I can't 22 guarantee it. 23 THE COURT: Okay. Well, we can leave it. 24 What do you guys want to do? This is off the 25 record.</p> <p style="text-align: center;">1365</p>
<p>1 notes here. 2 I think it's too opinionated and 3 argumentative. It could cause speculation in areas by 4 the type of writing that it is, the statements. It can 5 cause too much speculation. It doesn't really deal 6 specifically with Monsanto. I just think in any case 7 the prejudice would outweigh the relevance of it, so 8 I'm just not going to allow the book. 9 MR. KHERKHER: Your Honor, we understand your 10 ruling. I still hope that when the first Exponent 11 witness comes into play, that you're open minded to 12 their 10K and their internal documents because this 13 employer of many, many Monsanto experts has some 14 admissions that this jury should be entitled to know 15 what their mission statement and their purpose and 16 their objective is. 17 THE COURT: That doesn't mean the book, 18 though. 19 MR. KHERKHER: I understand that, Your Honor, 20 but it seems like we're just getting shut down on every 21 aspect to put in bits and pieces. And life is full of 22 bits and pieces, and this case is full of bits and 23 pieces. 24 THE COURT: You know, I know you guys have put 25 in so much work on this case, and I'm cognizant of</p> <p style="text-align: center;">1364</p>	<p>1 (A discussion was held off the record.) 2 (The following proceedings were held in the 3 courtroom in the presence of the jury.) 4 THE COURT: We'll be in session. You may be 5 seated. I've been told they're supposed to stop this 6 noise completely at 1:20, but who knows if that'll 7 happen. If it's too loud or if you can't hear 8 something, let us know. You have to be able to hear 9 the question and the answer. 10 And I know after having lunch and this 11 comfortable courtroom, it's easy to dose off, so I 12 don't want to see any of that. Just don't close your 13 eyes. I know people always say, I'm just resting my 14 eyes. I'm not sleeping. Well, I can't tell if you're 15 resting your eyes or you're not, so just keep them 16 open, okay? 17 We're on cross-examination. Mr. Miller. 18 MR. MILLER: Your Honor, thank you very much. 19 CONTINUATION OF CROSS-EXAMINATION 20 BY MR. MILLER: 21 Q. Good afternoon, ladies and gentlemen. 22 Dr. Rosner, we were talking before we took a 23 lunch break about PCBs being applied in foods. And I 24 think we established that to your knowledge PCBs were 25 not intentionally added to food as an ingredient; is</p> <p style="text-align: center;">1366</p>

<p>1 that correct?</p> <p>2 A. That's correct.</p> <p>3 Q. And to your knowledge, doctor, based on your</p> <p>4 review of the historical record, would you agree that</p> <p>5 PCBs were not directly sprayed onto food crops to your</p> <p>6 knowledge?</p> <p>7 A. Well, again, I've seen it advertised as</p> <p>8 insecticide and not on food crops, I guess, no.</p> <p>9 Q. During the course of direct examination,</p> <p>10 P-0188 was admitted into evidence. I wanted to ask you</p> <p>11 some questions about this, doctor.</p> <p>12 THE COURT: Adam, your voice is kind of -- Can</p> <p>13 you all hear him? Your voice kind of drops.</p> <p>14 MR. MILLER: My voice is dropping, and I'm</p> <p>15 about to fall, so...</p> <p>16 Q. (By Mr. Miller) Doctor, can you see the</p> <p>17 document?</p> <p>18 A. Yes. It's a little small, but I can see it.</p> <p>19 Q. Okay. And just for our recollection, this is</p> <p>20 the March 1961 Monsanto document entitled Monsanto</p> <p>21 Aroclor Resins for Insecticide Formulations; is that</p> <p>22 right?</p> <p>23 A. That's correct.</p> <p>24 Q. And it starts out with how the development</p> <p>25 came to be that aroclors were suggested as use as a</p> <p style="text-align: center;">1367</p>	<p>1 sprays, it says the USDA scientists developed this</p> <p>2 technique, correct?</p> <p>3 A. That's what that says.</p> <p>4 Q. All right. And if you'd refer to the</p> <p>5 remaining portion of the document, there are various</p> <p>6 so-called recipes that Monsanto, on page 3 refers to</p> <p>7 experimental work and formulations. Do you see that?</p> <p>8 A. I'm sorry?</p> <p>9 MR. MILLER: May I approach the witness,</p> <p>10 Your Honor?</p> <p>11 THE COURT: Yes.</p> <p>12 Q. (By Mr. Miller) I don't know what happened to</p> <p>13 the exhibits up here, but it says "Experimental Work</p> <p>14 and Formulations"?</p> <p>15 A. Yes.</p> <p>16 Q. And it refers to Aroclor 5460 formulations as</p> <p>17 used in the USDA experiments, correct?</p> <p>18 A. That's right.</p> <p>19 Q. And below that, for application as an</p> <p>20 emulsion, the recommendation is, again, 5460; is that</p> <p>21 correct?</p> <p>22 A. That's what it says therehere, yes.</p> <p>23 Q. And on the next page, again, for use as</p> <p>24 pressurized aerosol type sprays, Aroclor 5460 is a</p> <p>25 terphenyl and not a PCB, correct, doctor?</p> <p style="text-align: center;">1369</p>
<p>1 pesticide extender; is that correct?</p> <p>2 A. That's what I believe, yes.</p> <p>3 Q. Okay. Now, just as we read through this, I</p> <p>4 want you to confirm that Aroclor 5460 is a</p> <p>5 polychlorinated terphenyl and not a polychlorinated</p> <p>6 biphenyl, correct?</p> <p>7 A. Yes. In general, that's how it's referred.</p> <p>8 Q. Okay. And it reads "A Discovery. A simple</p> <p>9 method of increasing the service life of expensive</p> <p>10 lindane sprays was developed several years ago by the</p> <p>11 U.S. Department of Agriculture scientists at their</p> <p>12 Beltsville, Maryland testing station. The technique</p> <p>13 was to incorporate Monsanto's Aroclor 5460, a resinous</p> <p>14 chlorinated terphenyl in the lindane solution."</p> <p>15 So this indicates that the use of aroclors as</p> <p>16 a pesticide extender was first developed by the United</p> <p>17 States Department of Agriculture.</p> <p>18 A. Yes.</p> <p>19 Q. All right.</p> <p>20 A. Well, this is '61. That I'm not sure of.</p> <p>21 Q. All right.</p> <p>22 A. I just don't know. I think that it was</p> <p>23 advertised earlier than that as an extender in other</p> <p>24 materials I've seen. I'm not sure.</p> <p>25 Q. All right. Well, with respect to lindane</p> <p style="text-align: center;">1368</p>	<p>1 A. Yes. Of course, there's a little bit of PCB</p> <p>2 in it, but basically it's a terphenyl.</p> <p>3 Q. By the way, doctor, at this period of time</p> <p>4 would you confirm that it was not known that PCBs, a</p> <p>5 tiny fraction would be remaining in PCTs?</p> <p>6 A. That I can't say. I don't know.</p> <p>7 Q. That was a scientific development that</p> <p>8 occurred much later than 1961 as far as you recall?</p> <p>9 A. Not that I know of. I just don't know.</p> <p>10 Q. All right. Doctor, during direct examination</p> <p>11 you were provided, and this was admitted into evidence,</p> <p>12 P-3240. This is an advertisement from 1957 from the</p> <p>13 journal Chemical Week, correct?</p> <p>14 A. That's right.</p> <p>15 MR. MILLER: Can you turn to the second page,</p> <p>16 please, Scott.</p> <p>17 Q. (By Mr. Miller) This, again, refers to</p> <p>18 Aroclor 5460; is that correct?</p> <p>19 A. In the top margin it does, yes.</p> <p>20 Q. All right. And these two applications that</p> <p>21 are depicted photographically, this doesn't indicate</p> <p>22 that these are PCBs, correct, doctor?</p> <p>23 A. It doesn't say either way.</p> <p>24 Q. And with respect to your testimony concerning</p> <p>25 PCBs as a pesticide extender -- Do you need a copy,</p> <p style="text-align: center;">1370</p>

<p>1 Steve?</p> <p>2 MR. JENSEN: I don't.</p> <p>3 A. All I think that we did here was point out</p> <p>4 that it mentioned the PCBs 1254 for wet surfaces as a</p> <p>5 possible use.</p> <p>6 Q. (By Mr. Miller) As a possible use. So let's</p> <p>7 just go back so we can refresh where we are. We're</p> <p>8 looking at P-0155. This is the Technical Bulletin from</p> <p>9 December 1960; is that correct?</p> <p>10 A. Yes.</p> <p>11 Q. And it's called Aroclor Plasticizers. Will</p> <p>12 you confirm that for us, please?</p> <p>13 A. Yes.</p> <p>14 Q. And if you turn to page 36, which is 074946,</p> <p>15 this is the portion that you've highlighted for the</p> <p>16 jury; is that correct?</p> <p>17 A. I'm sorry. Could you give me a minute? I'm</p> <p>18 sorry.</p> <p>19 Q. Yes?</p> <p>20 A. Yes.</p> <p>21 Q. Okay. This section reads "Vapor Suppression</p> <p>22 (For Longer Insecticide Kill-Life)"; is that right?</p> <p>23 A. That's right.</p> <p>24 Q. And it discusses the use of, again, the</p> <p>25 Polychlorinated Terphenyl 5460 as the aroclor for use</p> <p style="text-align: center;">1371</p>	<p>1 determine whether there had been any leaks into food by</p> <p>2 Therminol FR in heat exchange systems?</p> <p>3 A. If you can show me the document to refresh my</p> <p>4 memory. I'm not sure if it was a survey or just a</p> <p>5 questionnaire.</p> <p>6 Q. Doctor, I'm going to hand you P-0506.</p> <p>7 THE COURT: Is that already in evidence?</p> <p>8 MR. MILLER: I don't believe it is.</p> <p>9 MS. BUCK: It is.</p> <p>10 MR. MILLER: It is? Do you need another copy,</p> <p>11 Your Honor?</p> <p>12 THE COURT: No.</p> <p>13 Q. (By Mr. Miller) This is the January 3, 1969</p> <p>14 document Therminol FR. FR refers to resistant; is that</p> <p>15 correct?</p> <p>16 A. Yes.</p> <p>17 Q. Okay. Fire resistant then would refer to the</p> <p>18 application of Therminol in areas where fire resistance</p> <p>19 was specifically important, correct?</p> <p>20 A. Yes.</p> <p>21 Q. All right. It reads, "Therminol FR system</p> <p>22 experience and design considerations for food</p> <p>23 applications." And it reads, "We know of two metal</p> <p>24 failures that allowed Aroclor/Therminol FR to contact</p> <p>25 the food product. In both incidents, the cooking oil</p> <p style="text-align: center;">1373</p>
<p>1 as an insecticide extender. There's a little</p> <p>2 discussion of something else at the bottom, but</p> <p>3 primarily it's regarding 5460; is that correct?</p> <p>4 A. Well, this is for hard surfaces, and they say</p> <p>5 at the bottom, "For non-crop insecticide formulations</p> <p>6 containing chlordane, other resinous aroclor compounds</p> <p>7 1254, 1260, 1262, 4465 and 5442, also nonvolatile and</p> <p>8 sticky or tacky, likewise merit evaluation as</p> <p>9 insecticide extenders."</p> <p>10 Q. Right. Now, would you agree with me,</p> <p>11 Dr. Rosner, that this document, and specifically the</p> <p>12 portion that you read, doesn't say anything about</p> <p>13 Monsanto recommending PCBs for use on crops, correct?</p> <p>14 A. This is for non-crop insect formulations.</p> <p>15 Q. Thank you. We talked about Therminol this</p> <p>16 morning and various applications in food processes,</p> <p>17 correct?</p> <p>18 A. Yes.</p> <p>19 Q. And we talked about the Yusho incident that</p> <p>20 occurred in Japan involving the Japanese manufacturers</p> <p>21 of PCBs, correct?</p> <p>22 A. That's right.</p> <p>23 Q. All right. And after that incident occurred,</p> <p>24 you're aware that Monsanto undertook an effort to do an</p> <p>25 inventory of the various users of Therminol to</p> <p style="text-align: center;">1372</p>	<p>1 and food product was discarded." I read that</p> <p>2 correctly?</p> <p>3 A. Yes.</p> <p>4 Q. All right. It goes on to read -- I'm going to</p> <p>5 read what wasn't highlighted here. "The contamination</p> <p>6 was discovered when the characteristic odor of</p> <p>7 Aroclor/Therminol FR was noticed." That indicates to</p> <p>8 you that Therminol FR had a characteristic odor that in</p> <p>9 certain circumstances would alert the user that there</p> <p>10 was a possible leak, correct?</p> <p>11 A. I guess if there was enough of it, correct.</p> <p>12 Q. "These failures were the result of pinhole</p> <p>13 leaks in the exchanger piping. In one case, cooking</p> <p>14 oil caused the pinholes to occur in mild steel</p> <p>15 exchanger tubing, where Therminol FR-2 is used to heat</p> <p>16 the cooking oil to approximately 420 degrees Fahrenheit.</p> <p>17 "In the second case, Therminol FR-1 leaked</p> <p>18 into a food fryer through a faulty weld site on 304</p> <p>19 stainless steel pipe."</p> <p>20 For my next act, ladies and gentlemen.</p> <p>21 This indicates that there was some effort</p> <p>22 undertaken by Monsanto to determine how these leaks</p> <p>23 occurred, correct?</p> <p>24 A. It's hardly a survey, I guess. That's all I</p> <p>25 was thinking about.</p> <p style="text-align: center;">1374</p>

<p>1 Q. Monsanto was trying to learn under what 2 circumstances these two metal failures allowed 3 Aroclor/Therminol to leak into oil, correct? 4 A. Yes. 5 Q. All right. It goes on to read, "Two 6 additional failures in Therminol heated food equipment 7 are noted where the heat transfer fluid did not contact 8 the food product or food contacted surfaces. One 9 failure was due to the expansion difference of two 10 metals, and the other failure was the result of poor 11 design, high temperature and low flow. It is also 12 interesting to note that not one failure has been 13 reported on the approximately 192,000 electrically 14 heated stainless steel fry pans containing Therminol 15 FR-3." 16 So there are a couple of things being 17 discussed here. One is that there have been two 18 instances where Therminol was allowed to contact 19 surfaces, correct, where food was -- food equipment 20 was -- Well, let me start again. 21 It says, "Two additional failures in Therminol 22 heated food equipment are noted where the heat transfer 23 fluid did not contact the food product or food 24 contacted surfaces." So what that's saying is there 25 was a leak, but it didn't touch food or food surfaces,</p> <p style="text-align: center;">1375</p>	<p>1 correct? 2 A. As I said, you know, I don't generally report 3 when I break a glass. I just don't report it. I don't 4 know who would report it. 5 Q. Doctor, that wasn't the question I asked. 6 A. I don't know. 7 Q. I asked the question, do you know? 8 A. I do not know. 9 Q. All right. And we're not here to speculate. 10 A. I know. That's what I'm saying. I don't know 11 how they got this information. You're asking me about 12 a survey. This is not a survey. That's all. 13 Q. All right. 14 A. Some reports. 15 Q. But you have seen no document in the hundreds 16 of thousands of pages you have reviewed that indicates 17 that any of these West Bend fryers leaked Therminol 18 into food, correct? 19 A. I don't know. 20 Q. But you do know that these fry pans had a very 21 small amount of Therminol in a contained box. Is that 22 your understanding? 23 A. I don't know how they're made. 24 Q. All right. So we know from this document of 25 four instances where Therminol has been reported to</p> <p style="text-align: center;">1377</p>
<p>1 correct? 2 A. Yes, in those two additional failures, that's 3 what it says. 4 Q. All right. And in the bottom paragraph, the 5 memo refers to the West Bend fry pans that you 6 discussed during direct examination, correct? 7 A. I guess. 8 Q. And with respect to the 192,000 West Bend 9 fry pans, there hasn't been a single report that those 10 fry pans have leaked, correct? 11 A. Right. I'm not -- 12 Q. That's correct? 13 A. That's what it says, but you asked me the 14 question about whether this was a survey. These are 15 just reports that they're getting in. They have no 16 idea what broke and what happened elsewhere. Just 17 don't know. 18 Q. Doctor, have you determined by looking at the 19 West Bend fry company what their failure rate was with 20 respect to these products? 21 A. I don't know how you'd ever know if you broke 22 that in your home. I just have no idea whether it 23 would be reported or not. 24 Q. In any event, you know of no circumstance 25 where one of these West Bend fry pans leaked Therminol,</p> <p style="text-align: center;">1376</p>	<p>1 have leaked, and in no instance has food been sold that 2 contained Therminol in it as far as this document 3 reports, correct? 4 A. As far as that document reports, yes. 5 Q. All right. And it's true, doctor, that you 6 know of no instance where food contaminated with 7 Therminol was sold and consumed prior to Monsanto 8 getting out of that business in 1970; is that correct? 9 A. Again, you know, the only instances we have 10 are the Frito Lay where they reported that they had it 11 in their frying oil and that ostensibly something was 12 cooked in it, but I have no idea whether it got into 13 the food itself. 14 Q. But you have no document whatsoever from the 15 hundreds of thousands that you have reviewed that 16 indicates that Frito Lay sold one potato chip with -- 17 that had been cooked in oil contaminated with 18 Therminol, correct? 19 A. No, I have not. 20 Q. Nor any other food manufacturer? You have no 21 information that any food was sold that had been 22 contaminated with Therminol, correct, sir? 23 A. I have no information about that, other than, 24 of course, the Yusho experiment. 25 Q. Which occurred in Japan and did not include</p> <p style="text-align: center;">1378</p>

<p>1 Monsanto's Therminol, correct?</p> <p>2 A. That's correct.</p> <p>3 Q. And, incidentally, there had been no report in</p> <p>4 the United States of an event like Yusho, correct, sir,</p> <p>5 where people were poisoned with PCBs that had been</p> <p>6 contaminated in rice grain?</p> <p>7 A. No, there's not.</p> <p>8 Q. You mentioned -- Either you mentioned or</p> <p>9 Mr. Jensen mentioned with respect to this Saturday</p> <p>10 Evening Post advertisement that you showed the jury,</p> <p>11 that paints had been used to paint the interior of</p> <p>12 silos. And this morning you talked about various</p> <p>13 reports in 1970 that interiors of silos had been</p> <p>14 painted with paint containing PCBs, correct?</p> <p>15 A. I believe it was the exterior of silos in that</p> <p>16 advertisement, but I may be wrong.</p> <p>17 Q. Okay. That was a smoke stack, by the way.</p> <p>18 A. Oh, was it?</p> <p>19 Q. Yeah.</p> <p>20 A. Okay.</p> <p>21 Q. All right. So let's talk about the silos.</p> <p>22 Those reports were first received by Monsanto in 1970,</p> <p>23 correct?</p> <p>24 A. I believe so.</p> <p>25 Q. All right. And those reports in 1970 referred</p> <p style="text-align: center;">1379</p>	<p>1 Q. And some of the information that is contained</p> <p>2 in this type of a bulletin would be information about</p> <p>3 the solubility of various aroclors, PCBs?</p> <p>4 A. They have various kinds of information, yes.</p> <p>5 Q. Various chemical characteristics and</p> <p>6 properties of PCBs, correct?</p> <p>7 A. That's right.</p> <p>8 Q. And solubility refers to whether or not a</p> <p>9 particular material can be dissolved in a solution?</p> <p>10 A. Yes.</p> <p>11 Q. For example, if we put sugar in water, that</p> <p>12 will dissolve, correct?</p> <p>13 A. Yes.</p> <p>14 Q. And when we do that, when we do that, we say</p> <p>15 that sugar is soluble in water, correct?</p> <p>16 A. Yes.</p> <p>17 Q. Now, typically aroclors are not soluble in</p> <p>18 water. That was one of the huge benefits of aroclor?</p> <p>19 A. That's right.</p> <p>20 Q. Particularly PCBs, they were not soluble in</p> <p>21 water, correct?</p> <p>22 A. That's right.</p> <p>23 Q. Which means when you put them in paint, like</p> <p>24 the U.S. Navy did, or when industry put them on</p> <p>25 vessels, in chemical plants, they would not dissolve in</p> <p style="text-align: center;">1381</p>
<p>1 to a paint that had Aroclor 1254 in it, correct?</p> <p>2 A. That's the number I remember also.</p> <p>3 Q. All right. And would you confirm for us that</p> <p>4 Monsanto did not manufacture that paint, correct?</p> <p>5 A. I was -- Well, again, I don't know the various</p> <p>6 parts of Monsanto. I think it was probably some other</p> <p>7 company that bought it, but I don't really know that.</p> <p>8 Q. Doctor, are you familiar with the process in</p> <p>9 which silage ferments in silos?</p> <p>10 A. No, I'm not.</p> <p>11 Q. Okay. I want you to assume hypothetically</p> <p>12 that when silage ferments, it produces something called</p> <p>13 acetic acid, all right? Will you assume that for me?</p> <p>14 A. I'll assume anything you want.</p> <p>15 Q. Okay. And digging through some documents here</p> <p>16 with the help of Miss Jeffery, do you recall, sir, that</p> <p>17 Monsanto's bulletins for its PCBs to be used as a</p> <p>18 plasticizers referred to the solubility of Aroclor 1254</p> <p>19 in acetic acid?</p> <p>20 A. I remember some line in some chart, but that's</p> <p>21 all I remember.</p> <p>22 Q. And these bulletins as we discussed earlier --</p> <p>23 They looked like these. Here's one, Aroclor</p> <p>24 Plasticizers. This is a Technical Bulletin?</p> <p>25 A. Yes.</p> <p style="text-align: center;">1380</p>	<p>1 water, correct, sir?</p> <p>2 A. That's right.</p> <p>3 Q. And that was an enormous benefit to the Navy</p> <p>4 because you can keep your ships out in the ocean and</p> <p>5 not have them in a dry dock as frequently, correct?</p> <p>6 A. I guess so. I suppose it happened.</p> <p>7 Q. And in a chemical plant it would be important</p> <p>8 so that you could mix chemicals in vats without those</p> <p>9 chemical -- without the painted coating on those vats</p> <p>10 being soluble in the material that you mixed, correct?</p> <p>11 A. I would assume so, yes.</p> <p>12 Q. All right. And would you agree with me that</p> <p>13 in the product bulletins that Monsanto issued in the</p> <p>14 '50s and '60s, before it was ever understood that</p> <p>15 somebody had used Aroclor 1254 in silo paint, that</p> <p>16 Monsanto reported to its customers in these bulletins</p> <p>17 that Aroclor 1254 was soluble in acetic acid?</p> <p>18 A. Again, maybe that's the chart I recall.</p> <p>19 That's all I remember.</p> <p>20 Q. This is Defendant's Exhibit D-4045. I'll hand</p> <p>21 this to you.</p> <p>22 MR. JENSEN: May I have a copy?</p> <p>23 MR. MILLER: Yes.</p> <p>24 Here, Your Honor.</p> <p>25 THE COURT: Thank you.</p> <p style="text-align: center;">1382</p>

<p>1 Q. (By Mr. Miller) You've seen this document,</p> <p>2 sir? You've reviewed, relied on it or considered it in</p> <p>3 connection with reaching your opinions in this case?</p> <p>4 A. Well, I've seen many like it, but I'm not sure</p> <p>5 if I've seen this specific one. I don't see a date on</p> <p>6 this.</p> <p>7 Q. This one is dated 1970.</p> <p>8 A. 1970. Okay.</p> <p>9 MR. MILLER: Your Honor, I'd ask for the</p> <p>10 admission of D-4045.</p> <p>11 MR. JENSEN: No objection.</p> <p>12 THE COURT: 4045 will be received in evidence.</p> <p>13 Q. (By Mr. Miller) My crew is shouting to me.</p> <p>14 Doctor, I want to show you also P-0155. This, I'm</p> <p>15 being told, is already in evidence.</p> <p>16 MR. MILLER: May I approach, Your Honor?</p> <p>17 THE COURT: Yes.</p> <p>18 Q. (By Mr. Miller) And, doctor, I don't mean to</p> <p>19 cramp you here. But there is a table very similar to</p> <p>20 the one that we looked at before. It's on page 40,</p> <p>21 MONS 074950. It will be up on your screen.</p> <p>22 A. Okay. Thanks.</p> <p>23 Q. And, incidentally, doctor, this is a Technical</p> <p>24 Bulletin from December 1960; is that right?</p> <p>25 A. That's right.</p> <p style="text-align: center;">1383</p>	<p>1 Q. And Monsanto also issued an environmental</p> <p>2 warning just after those reports were received,</p> <p>3 correct, sir?</p> <p>4 A. Yes.</p> <p>5 Q. All right. Now, I'm going to hand you D-4045</p> <p>6 that I think Your Honor just admitted into evidence.</p> <p>7 This is the Technical Bulletin from May of 1974,</p> <p>8 Aroclor Plasticizers, correct?</p> <p>9 A. Yes. It looks like it's the same.</p> <p>10 Q. And if you would, sir, would you turn to the</p> <p>11 second to last page.</p> <p>12 A. It says "District Sales Offices"?</p> <p>13 Q. Too far. I'm sorry. There is a paragraph</p> <p>14 entitled "Environmental Hazards". Previous page. All</p> <p>15 right.</p> <p>16 MR. MILLER: All right. Would you blow that</p> <p>17 up, Mr. Watson.</p> <p>18 Q. (By Mr. Miller) Let's read that. Now, this</p> <p>19 is from May of 1970, correct, sir?</p> <p>20 A. Yes.</p> <p>21 Q. "Environmental Hazards. Aroclor 1232,</p> <p>22 Aroclor 1242, Aroclor 1248, Aroclor 1254,</p> <p>23 Aroclor 1260, Aroclor 1262, Aroclor 1268, Aroclor 4465</p> <p>24 and Montar 1 all contain polychlorinated biphenyls</p> <p>25 (PCB) of various types and in varying amounts. PCB</p> <p style="text-align: center;">1385</p>
<p>1 Q. If you look at the Table 8 that we have here</p> <p>2 entitled "Solubility" -- That's not going to work.</p> <p>3 MR. MILLER: Scott, can you zoom in on -- I'm</p> <p>4 sorry. Table 13. Perfect. No, just the top portion</p> <p>5 of it. Thank you.</p> <p>6 Q. (By Mr. Miller) Do you see down at the second</p> <p>7 entry, it says, "Acetic Acid"?</p> <p>8 A. Is that the first one or the second one?</p> <p>9 Q. It's the first one under "Acid." It's called</p> <p>10 "Acetic Acid".</p> <p>11 A. Yes.</p> <p>12 Q. All right. And this table would indicate that</p> <p>13 Aroclor 1254 is soluble in acetic acid. That's what</p> <p>14 that "S" indicates there?</p> <p>15 A. Yes.</p> <p>16 Q. All right. Now, there came a time, as you</p> <p>17 mentioned earlier, that it was recorded in 1970 that</p> <p>18 PCBs had been used in silos, and Monsanto undertook</p> <p>19 some response; is that correct?</p> <p>20 A. I'm not sure what you're referring to, but I'm</p> <p>21 sure they did.</p> <p>22 Q. Okay. One of the things they did is they</p> <p>23 contacted the people in Ohio and Georgia where these</p> <p>24 reports had been made, correct?</p> <p>25 A. Yes.</p> <p style="text-align: center;">1384</p>	<p>1 residues in small amounts have been found in the</p> <p>2 environment and some studies have indicated that they</p> <p>3 may be harmful to certain forms of animal life.</p> <p>4 Extreme care should therefore be taken by all users of</p> <p>5 PCB containing products to prevent any entry into the</p> <p>6 environment through spills, leakage, use, disposal,</p> <p>7 vaporization or otherwise. Further, the products in</p> <p>8 which PCB materials are used or which are formulated</p> <p>9 using PCB materials as a component, should be given</p> <p>10 careful study to eliminate the possibility that PCB</p> <p>11 might reach the environment as a result of use in a</p> <p>12 given application.</p> <p>13 "Some specific applications where the use of</p> <p>14 PCB should definitely be avoided are in paints and</p> <p>15 sealants for swimming pools, paints and waterproofing</p> <p>16 agents in silos and other buildings where food products</p> <p>17 for humans or animals are stored, and as a component of</p> <p>18 any container or wrapping used in the packaging of food</p> <p>19 products", correct, sir?</p> <p>20 A. Yes.</p> <p>21 Q. Now, would you agree with me, Dr. Rosner, that</p> <p>22 in terms of our environmental awareness in the United</p> <p>23 States, that this is the first warning that you have</p> <p>24 seen of an environmental hazard using a chemical</p> <p>25 product?</p> <p style="text-align: center;">1386</p>

<p>1 A. Well, I mean, chemical products are supposed</p> <p>2 to have warnings going back to the '40s. There were</p> <p>3 all sorts of American Standard Association warnings.</p> <p>4 There were all sorts of recommendations from the MCA.</p> <p>5 There were National Safety Council warnings. There</p> <p>6 were lots of warnings.</p> <p>7 Q. This was the first warning that you are aware</p> <p>8 of about an environmental hazard associated with an</p> <p>9 industrial product that was not intended to be sprayed</p> <p>10 on crops, correct, sir?</p> <p>11 A. Well, again, I think we all know --</p> <p>12 Q. Is that correct, sir?</p> <p>13 A. Not really, no. I mean, if you want me to</p> <p>14 answer, I can answer that, but it's not really correct.</p> <p>15 Q. You ever seen a warning like this on</p> <p>16 industrial products not intended to be sprayed on</p> <p>17 crops? Is that your testimony?</p> <p>18 A. Not like this. But I think we all know about</p> <p>19 tetraethyl lead, used to be leaded gasoline. And there</p> <p>20 are always signs on the side of leaded gasoline about</p> <p>21 not breathing the material in, about the dangers of</p> <p>22 lead. These go back to the 1920's. I mean, it's not</p> <p>23 the only thing.</p> <p>24 Q. This is the first warning you are aware of</p> <p>25 where a manufacturer of an industrial product put on</p> <p style="text-align: center;">1387</p>	<p>1 Q. And the date of this is 1941; is that correct?</p> <p>2 A. 1942, I believe.</p> <p>3 Q. '42. I apologize. This is a review of</p> <p>4 abstracts relating to testing that had been done,</p> <p>5 toxicological testing on various compounds, correct?</p> <p>6 A. That's right.</p> <p>7 Q. And the reason they were put into this</p> <p>8 compendium is because whether or not the test was done</p> <p>9 for the purpose of detecting cancer, there were reports</p> <p>10 in these studies that might reflect that cancers could</p> <p>11 be caused by these materials?</p> <p>12 THE COURT: I'm sorry. We have to take a</p> <p>13 break for the jury.</p> <p>14 MR. MILLER: Okay.</p> <p>15 THE COURT: Ladies and gentlemen, we will have</p> <p>16 a recess.</p> <p>17 (The Court duly admonished the jury.)</p> <p>18 THE COURT: We'll be in brief recess.</p> <p>19 (A recess was taken.)</p> <p>20 THE COURT: Mr. Miller, you may resume your</p> <p>21 cross-examine.</p> <p>22 MR. MILLER: Thank you, Your Honor. I just</p> <p>23 wanted the record to reflect that I spilled my coffee</p> <p>24 on the inside of the lectern. I apologize to</p> <p>25 Your Honor.</p> <p style="text-align: center;">1389</p>
<p>1 a -- in a bulletin like this a warning about the</p> <p>2 environmental hazards associated with the product,</p> <p>3 correct, sir?</p> <p>4 A. Well, maybe I'm misunderstanding what you mean</p> <p>5 by environmental, but if you're talking about the</p> <p>6 dispersal of a toxin into the atmosphere, certainly</p> <p>7 lead, tetraethyl lead was considered a toxin, and it</p> <p>8 was not supposed to be -- it was supposed to be handled</p> <p>9 very carefully because it was dangerous.</p> <p>10 Q. Well, this is a worry about the risks</p> <p>11 associated with material affecting specifically the</p> <p>12 environment, and this is the first warning you're aware</p> <p>13 of, sir?</p> <p>14 A. No. Again, I'd have to think carefully about</p> <p>15 that. I can't really answer that, but certainly this</p> <p>16 is a period of greater environmental awareness, and</p> <p>17 this would be an example of that.</p> <p>18 Q. I want to talk to you, doctor, about these</p> <p>19 standards that you talked about with the jury</p> <p>20 yesterday. You talked about this document called the</p> <p>21 Hartwell compendium. It looks like this, P-2401.</p> <p>22 A. Thank you.</p> <p>23 Q. This is the Hartwell compendium you spoke</p> <p>24 about yesterday with the jury?</p> <p>25 A. Yes.</p> <p style="text-align: center;">1388</p>	<p>1 Q. (By Mr. Miller) Dr. Rosner, we were talking</p> <p>2 before our break about the Hartwell compendium that's</p> <p>3 Exhibit 2401. This is one of the documents that you</p> <p>4 showed the jury in connection with the standards that</p> <p>5 you proposed with respect to industrial conduct and</p> <p>6 testing of products, correct?</p> <p>7 A. Yes.</p> <p>8 Q. All right. Would you confirm for me,</p> <p>9 Dr. Rosner, that nowhere in this document is there a</p> <p>10 suggestion or requirement stated that all products be</p> <p>11 tested for cancer?</p> <p>12 A. No.</p> <p>13 Q. Incidentally, at the time that this compendium</p> <p>14 was prepared, there were thousands and thousands of</p> <p>15 products in commerce. Would you agree with that?</p> <p>16 A. Certainly.</p> <p>17 Q. And thousands and thousands of chemicals in</p> <p>18 commerce at that time?</p> <p>19 A. Yes.</p> <p>20 Q. And would you agree with me that the</p> <p>21 compendium only refers to tests being taken on about</p> <p>22 696 chemicals, correct?</p> <p>23 A. That's right.</p> <p>24 Q. So there were thousands and thousands of</p> <p>25 chemicals in commerce that had not been tested for</p> <p style="text-align: center;">1390</p>

<p>1 cancer; is that right?</p> <p>2 A. I would assume so, yes.</p> <p>3 Q. All right. Now, of the products that --</p> <p>4 Sorry -- the chemicals that were tested, you referred</p> <p>5 specifically to one called thorium dioxide, correct?</p> <p>6 A. Did I?</p> <p>7 Q. Yes. You showed the jury this table.</p> <p>8 A. Oh, let's see. Oh, I see.</p> <p>9 Q. Page -- Let me tell the page.</p> <p>10 A. It was an example of.</p> <p>11 Q. Right. PLTEXP034288. It's page 27 of the</p> <p>12 exhibit, correct?</p> <p>13 A. I'm sorry. Could you just point it out to me</p> <p>14 again? I don't know what you're referring to.</p> <p>15 Q. Sure. You showed the jury this table?</p> <p>16 A. Yes.</p> <p>17 Q. Which if you look on the previous page --</p> <p>18 A. Yes.</p> <p>19 Q. -- it's a continuation of a table for a</p> <p>20 chemical called, at the very top, 29, thorium dioxide.</p> <p>21 A. I see.</p> <p>22 Q. Would you confirm for us that thorium dioxide</p> <p>23 was a compound that was known to be radioactive?</p> <p>24 A. I just don't know. That sounds like it could</p> <p>25 be. Thorium was.</p> <p style="text-align: center;">1391</p>	<p>1 carcinogen.</p> <p>2 Q. Well, let's take a step back here.</p> <p>3 Benzo(a)pyrene was a chemical constituent of soot,</p> <p>4 correct?</p> <p>5 A. Yes. I accept that, yes.</p> <p>6 Q. And soot had been identified for over a</p> <p>7 hundred years before the Hartwell compendium as causing</p> <p>8 cancers in individuals who worked around it, correct?</p> <p>9 A. Probably a couple hundred years back.</p> <p>10 Q. A couple hundred years. So another compound</p> <p>11 in the Hartwell compendium are heterocyclic compounds,</p> <p>12 correct?</p> <p>13 A. I would guess so. You tell me.</p> <p>14 Q. I just told you. And would you agree with me</p> <p>15 that by 1930 it was well known that these heterocyclic</p> <p>16 compounds were causing cancers in the workers who</p> <p>17 worked with them or exposed to these materials?</p> <p>18 A. I'm sure it was suspected. I'm not sure what</p> <p>19 was known in the workforce.</p> <p>20 Q. Another group of compounds included in the</p> <p>21 Hartwell compendium are aniline dyes, correct?</p> <p>22 A. Yes.</p> <p>23 Q. And aniline dyes, would you confirm for us,</p> <p>24 were also known by the early 1900's and particularly by</p> <p>25 1930 to cause cancer in workers who handled those</p> <p style="text-align: center;">1393</p>
<p>1 Q. Thorium was. And in the early part of the</p> <p>2 20th century would you confirm for us that radioactive</p> <p>3 compounds were already known to cause cancers in humans</p> <p>4 who were working with them?</p> <p>5 A. Well, thorium, I'm not sure. Radium certainly</p> <p>6 was. I'm not sure about thorium at that point, but</p> <p>7 that makes sense.</p> <p>8 Q. Thank you. Would you also confirm that a</p> <p>9 number of compounds for which tests are recorded in the</p> <p>10 Hartwell index or compendium were chemicals called</p> <p>11 polycyclic compounds?</p> <p>12 A. Yeah. I'm sure that's in here.</p> <p>13 Q. In fact, there are about 180 different studies</p> <p>14 about polycyclic compounds, correct?</p> <p>15 A. I would assume so. I mean, I'd agree with</p> <p>16 that. I don't have any knowledge. I mean, I don't --</p> <p>17 I never counted them, but I would take your word for</p> <p>18 the 180.</p> <p>19 Q. And would you agree with me that polycyclic</p> <p>20 compounds like benzo(a)pyrene back in the 1930's was</p> <p>21 known to cause cancers in workers who were exposed to</p> <p>22 that material?</p> <p>23 A. Well, benzene compounds had been identified,</p> <p>24 benzene containing compounds. Benzene is a structure</p> <p>25 which had long been identified as a potential</p> <p style="text-align: center;">1392</p>	<p>1 aniline dyes, correct?</p> <p>2 A. In Germany, yes.</p> <p>3 Q. And there are dyes in the Hartwell compendium</p> <p>4 that were tested called azo dyes, correct?</p> <p>5 A. Again, I take your word for it.</p> <p>6 Q. And by the 1930's azo dyes were also known to</p> <p>7 cause bladder cancer in workers who handled azo dyes,</p> <p>8 correct?</p> <p>9 A. That makes sense, but I'm not sure about that.</p> <p>10 Q. And another group of compounds tested in the</p> <p>11 Hartwell compendium were a group of chemicals called</p> <p>12 steroids or steroid derivatives?</p> <p>13 A. Again, you're telling me. I don't know what's</p> <p>14 in the compendium.</p> <p>15 Q. Could you confirm for us that by the 1930's</p> <p>16 these steroid and steroid derivatives were already</p> <p>17 known to cause cancers in humans who were exposed to</p> <p>18 them frequently?</p> <p>19 A. Again, I'm not sure about that.</p> <p>20 Q. All right. So we've identified a number of</p> <p>21 compounds that were being tested for their</p> <p>22 carcinogenicity that had already been established as</p> <p>23 being causes of cancers in humans and workers who</p> <p>24 worked around them, correct, sir?</p> <p>25 A. Certainly. I'm sure there were lots of</p> <p style="text-align: center;">1394</p>

<p>1 compounds.</p> <p>2 Q. Now, would you agree with me, Dr. Rosner, that</p> <p>3 in the 1930's -- through the 1930's there had been no</p> <p>4 reports by Monsanto that its workers who worked in the</p> <p>5 PCB departments at Anniston or Krummrich had excess</p> <p>6 cancers?</p> <p>7 A. That was the point. It was being developed at</p> <p>8 this moment, yes.</p> <p>9 Q. I'm sorry. Could you answer my question?</p> <p>10 A. Yes.</p> <p>11 Q. Could you confirm that there was no excess</p> <p>12 reporting?</p> <p>13 A. Again, I don't know that for a fact, but I</p> <p>14 wouldn't expect it to.</p> <p>15 Q. And in companies like General Electric and</p> <p>16 Westinghouse and NCR and other companies that were</p> <p>17 exposing workers to PCBs day in and day out, there</p> <p>18 weren't reports in the 1930's that their workers were</p> <p>19 contracting excess cancers, correct?</p> <p>20 A. I don't know that anyone looked for it, so I</p> <p>21 don't know.</p> <p>22 Q. And that's true in the 1940's, correct, that</p> <p>23 there hadn't been reports by the end of the 1940's that</p> <p>24 workers handling and using PCBs day in and day out at</p> <p>25 their work were experiencing excess cancers, correct,</p> <p style="text-align: center;">1395</p>	<p>1 they have workers who work with PCBs every day who have</p> <p>2 excess cancers? You haven't seen any such document?</p> <p>3 A. No.</p> <p>4 Q. And you haven't seen any such document about</p> <p>5 Westinghouse or NCR, correct?</p> <p>6 A. No.</p> <p>7 Q. And that's true of the 1960's, correct, sir?</p> <p>8 A. That's right. I don't think I saw them in the</p> <p>9 1970's or '80s either about Westinghouse or those</p> <p>10 companies.</p> <p>11 Q. Thank you. Now, let's take a step back about</p> <p>12 the Hartwell compendium. Would you agree with me,</p> <p>13 doctor, that there isn't a section in this compendium</p> <p>14 that says, here's the specific method you should use to</p> <p>15 test your product for cancer?</p> <p>16 A. No. These are all just searching for</p> <p>17 literature.</p> <p>18 Q. And you haven't seen any document or any</p> <p>19 portion of this document that says here are the number</p> <p>20 of species that you need to use in order to test for</p> <p>21 cancer, correct?</p> <p>22 A. No. Some were individual rats. Some were</p> <p>23 mice. Some were one animal. Some were observational</p> <p>24 reports. It's a wide variety of materials.</p> <p>25 Q. The Hartwell compendium doesn't tell you how</p> <p style="text-align: center;">1397</p>
<p>1 sir?</p> <p>2 A. Not that I recall.</p> <p>3 Q. And that's true for the 1950's. PCB workers</p> <p>4 at Monsanto, Sauget and Krummrich -- I'm sorry --</p> <p>5 Sauget and Anniston and GE workers and Westinghouse</p> <p>6 workers, they weren't reporting excess cancers among</p> <p>7 their workers, correct?</p> <p>8 A. Well, again, I really don't know what their</p> <p>9 reporting system was. All I can say is that Monsanto</p> <p>10 kept this informal list of people who were developing</p> <p>11 cancers all over the place. So I don't know if they</p> <p>12 ever figured out if they were excess or not. I don't</p> <p>13 think they were. It was a very informal list.</p> <p>14 Q. Have you heard or seen any documents in the</p> <p>15 hundreds of thousands that you have reviewed that</p> <p>16 suggests that General Electric was reporting to</p> <p>17 Monsanto that its capacitor manufacturing workers who</p> <p>18 worked day in and day out in PCBs up to their elbows</p> <p>19 had excess cancers?</p> <p>20 A. I don't know about your depiction of how they</p> <p>21 worked with them. Monsanto, I don't know -- I assume.</p> <p>22 I have no idea whether there was any reporting system</p> <p>23 at all.</p> <p>24 Q. You haven't seen any report, any document that</p> <p>25 says General Electric is reporting to Monsanto that</p> <p style="text-align: center;">1396</p>	<p>1 long to conduct such a test, correct?</p> <p>2 A. No. Just at least a month.</p> <p>3 Q. At least a month. Thank you. Does the</p> <p>4 Hartwell compendium say anything about whether cancer</p> <p>5 testing was a standard in the industry in the 1940's?</p> <p>6 A. No. Just that it was being done.</p> <p>7 Q. I want to turn your attention to another</p> <p>8 document that you relied on for the proposition that</p> <p>9 there were standards for testing. This one is P-1126</p> <p>10 from 1942.</p> <p>11 A. I don't think I said standards for testing. I</p> <p>12 said there are standards for good behavior.</p> <p>13 Q. Okay. Well, let's evaluate some. So this is</p> <p>14 a document published in the Industrial Hygiene</p> <p>15 Foundation of America -- What did you call it? A</p> <p>16 proceedings from the Seventh Annual Meeting of Members?</p> <p>17 A. It's the report, the Industrial Hygiene</p> <p>18 Foundation of America, Seventh Annual Meeting of</p> <p>19 Members.</p> <p>20 Q. And this was written by a</p> <p>21 Dr. Francis R. Holden; is that correct?</p> <p>22 A. That's right.</p> <p>23 Q. Would you confirm for me that there is no</p> <p>24 mention in this document that long-term cancer tests</p> <p>25 were the standard in the industry?</p> <p style="text-align: center;">1398</p>

<p>1 A. No.</p> <p>2 Q. Do the words "cancer" or "chronic" even appear</p> <p>3 in this document?</p> <p>4 A. No.</p> <p>5 Q. It did say -- I think you mentioned that it</p> <p>6 said every new chemical or product should be</p> <p>7 investigated as to its toxicity before it is prepared</p> <p>8 in large amounts to be released in public, correct?</p> <p>9 A. That's right.</p> <p>10 Q. All right. This was 1942; is that right?</p> <p>11 A. Yes, I believe it was.</p> <p>12 Q. And PCBs had been marketed by Monsanto and</p> <p>13 used by General Electric and Westinghouse for 12 years</p> <p>14 at the time, correct, or more?</p> <p>15 A. Well, it was created in 1930, and I don't know</p> <p>16 how heavily marketed it was.</p> <p>17 Q. And you know that during the 1930's -- And</p> <p>18 we'll talk about this in a little bit -- there were</p> <p>19 toxicity testing undertaken by Monsanto of PCBs and</p> <p>20 other compounds?</p> <p>21 A. Well, that's the Drinker studies that you're</p> <p>22 referring to?</p> <p>23 Q. Yes.</p> <p>24 A. Yes.</p> <p>25 Q. All right. You also mentioned a document by</p> <p style="text-align: center;">1399</p>	<p>1 decisions about what it had to do. It was supposed to</p> <p>2 look for dangers of its product. That's what it was</p> <p>3 supposed to do. If it was appropriate to do long-term</p> <p>4 testing, that's what they should be doing. That's what</p> <p>5 the standard was.</p> <p>6 Q. Dr. Rosner, on December 13, 2011, your</p> <p>7 deposition was taken in connection with these matters;</p> <p>8 is that correct?</p> <p>9 A. 2011?</p> <p>10 Q. Yes.</p> <p>11 A. I guess so, yes.</p> <p>12 Q. I'd like to refer you, doctor, to page 138,</p> <p>13 lines 18 to 24. This is a deposition that you sat in.</p> <p>14 You gave testimony under oath that day; is that</p> <p>15 correct?</p> <p>16 A. Oh, certainly.</p> <p>17 Q. The same oath that was administered to you by</p> <p>18 our court reporter this morning, correct?</p> <p>19 A. That's right.</p> <p>20 Q. And you were asked the following question:</p> <p>21 "QUESTION: You cannot say one way or another whether</p> <p>22 it was common practice for chemical companies to do</p> <p>23 long-term, chronic animal tests prior to 1970?" And</p> <p>24 your answer was, "I cannot say one way or the other</p> <p>25 because I have not studied the entire world of chemical</p> <p style="text-align: center;">1401</p>
<p>1 Hueper.</p> <p>2 A. Wilhelm Hueper.</p> <p>3 Q. Dr. Hueper was a gentleman that came over to</p> <p>4 the United States and worked at DuPont; is that</p> <p>5 correct?</p> <p>6 A. Originally, yes.</p> <p>7 Q. And did he work at a laboratory called the</p> <p>8 Haskell Laboratories?</p> <p>9 A. Yes.</p> <p>10 Q. And that was a laboratory that was operated by</p> <p>11 DuPont; is that right?</p> <p>12 A. That's right.</p> <p>13 Q. Now, the document you showed the jury, this</p> <p>14 Hueper document, would you confirm for us that it, too,</p> <p>15 says nothing about a standard for doing long-term</p> <p>16 cancer tests, correct?</p> <p>17 A. No. Again, it says that this is a problem we</p> <p>18 have to be following and watching, and it's about</p> <p>19 occupational tumors. It's a compendium of about</p> <p>20 700 pages.</p> <p>21 Q. Doctor, would you agree with me that prior to</p> <p>22 1970 you can't say one way or the other whether it was</p> <p>23 actually common practice for chemical companies to do</p> <p>24 long-term, chronic animal tests?</p> <p>25 A. Again, I think each company made its own</p> <p style="text-align: center;">1400</p>	<p>1 industry"; is that correct? That was the testimony you</p> <p>2 gave under oath that day, correct, sir?</p> <p>3 A. That's what I just said. I talked to you</p> <p>4 about the chemicals I know.</p> <p>5 Q. Doctor, there's no question on the floor.</p> <p>6 And, doctor, would you confirm for me that you</p> <p>7 have no document that you can show this jury today that</p> <p>8 you brought with you or that you found in the last</p> <p>9 eight years looking at materials relating to this</p> <p>10 matter, you have no document that says cancer testing</p> <p>11 was the standard in the industry in the 1930's, '40s,</p> <p>12 '50s or '60s, correct, sir?</p> <p>13 A. I never said that. No, I don't.</p> <p>14 Q. You gave testimony in May of 2015; is that</p> <p>15 correct?</p> <p>16 A. I have given testimony in every year since</p> <p>17 2008.</p> <p>18 Q. Specifically on May 14, 2015 you gave</p> <p>19 testimony in a proceeding; is that correct, sir?</p> <p>20 A. Yes.</p> <p>21 Q. Would you turn to, in that proceeding, the</p> <p>22 transcript there, page 260.</p> <p>23 MR. JENSEN: What's the page and line? Did</p> <p>24 you say?</p> <p>25 MR. MILLER: I'm getting there. Sorry.</p> <p style="text-align: center;">1402</p>

<p>1 MR. JENSEN: Your Honor, I have an objection.</p> <p>2 I don't think this is proper impeachment. There's not</p> <p>3 been a prior inconsistent statement.</p> <p>4 MR. MILLER: Why don't I ask the question</p> <p>5 again?</p> <p>6 THE COURT: All right.</p> <p>7 Q. (By Mr. Miller) So you don't have a document</p> <p>8 that says long-term cancer testing was the standard in</p> <p>9 the industry from the 1930's, correct?</p> <p>10 A. I'm sorry. Where are you?</p> <p>11 Q. I'm on page 260, line 11. Your answer is on</p> <p>12 lines 14 and 15.</p> <p>13 A. Okay. That's right. Okay. Yes.</p> <p>14 Q. Okay. We don't have a document in the 1940's</p> <p>15 that says cancer testing was the standard in the</p> <p>16 industry, correct?</p> <p>17 A. That's right. No, I don't believe so.</p> <p>18 Q. All right. And we don't have one document</p> <p>19 from the 1950's that says cancer testing was the</p> <p>20 standard in the industry, correct?</p> <p>21 A. That's right. Again, that's what I've been</p> <p>22 saying.</p> <p>23 Q. And we don't have one document from the '60s</p> <p>24 that says the standard in the industry was to test for</p> <p>25 cancer, correct, sir?</p> <p style="text-align: center;">1403</p>	<p>1 Q. Let's talk about -- We're going to get to the</p> <p>2 Drinker study. So let's talk about the Drinker study.</p> <p>3 In the Drinker study in 1937,</p> <p>4 Dr. Cecil Drinker from Harvard conducted toxicological</p> <p>5 tests using animals, exposing them to compounds that</p> <p>6 included PCBs and chlorinated naphthalenes, correct?</p> <p>7 A. Yes, I believe so.</p> <p>8 Q. All right. And the doses that were</p> <p>9 administered to the laboratory animals were very high.</p> <p>10 Would you agree with that?</p> <p>11 A. They were more than you would normally get.</p> <p>12 Of course, they're high, yes. You need to have a</p> <p>13 response in a very short period of time.</p> <p>14 Q. In fact, doctor, those tests exposed the</p> <p>15 laboratory animals to doses of PCBs and naphthalenes</p> <p>16 tens of thousands to hundreds of thousands of times</p> <p>17 higher than average daily human intake. Would you</p> <p>18 agree with that?</p> <p>19 A. I would hope so, yes.</p> <p>20 Q. All right. And the reason why very high doses</p> <p>21 in these studies are used is because you want to see a</p> <p>22 response, and so giving a low dose might not result in</p> <p>23 a response. You want to see a result, so you give a</p> <p>24 very high dose, correct?</p> <p>25 A. That's why you give different levels of doses</p> <p style="text-align: center;">1405</p>
<p>1 A. I think that's what I've been answering all</p> <p>2 along here.</p> <p>3 THE COURT: I think he did testify to that.</p> <p>4 That's what your objection was.</p> <p>5 MR. MILLER: Thank you, Judge.</p> <p>6 Q. (By Mr. Miller) Now, doctor, I want to refer</p> <p>7 back to some of these early tests that Monsanto did.</p> <p>8 And you understand that during the course of the period</p> <p>9 of time that we've been talking about from the 1930's</p> <p>10 through the late 1970's Monsanto conducted over 300</p> <p>11 toxicological tests of PCBs, correct?</p> <p>12 A. I believe short-term tests, yes.</p> <p>13 Q. But 300 of them?</p> <p>14 A. Yes.</p> <p>15 Q. All right. Now, when we talk about these</p> <p>16 early cancer tests or any toxicological tests, even</p> <p>17 those that are done in modern times today, very high</p> <p>18 doses of the chemical are used in the assay, correct?</p> <p>19 And the assay's the test?</p> <p>20 A. Again, it depends on the model, the design</p> <p>21 they're using in developing the test. There are some</p> <p>22 who do get very high doses, but depending upon the</p> <p>23 model, you might have low dose, middle dose, high dose.</p> <p>24 There are all sorts of models that are being used for</p> <p>25 epidemiological studies.</p> <p style="text-align: center;">1404</p>	<p>1 and different time lengths, and that's why you try to</p> <p>2 design a study that will detect some change at some</p> <p>3 level, so you get a sense of whether or not this is a</p> <p>4 material that can cause change biologically.</p> <p>5 Q. Not only whether you can determine whether the</p> <p>6 material causes change biologically, but at what dose</p> <p>7 those biological changes occur, correct?</p> <p>8 A. Well, at what dose for that animal, for what</p> <p>9 period of time. I mean they're not going to substitute</p> <p>10 the amount for the length of time. You can't keep an</p> <p>11 animal alive for 40 years and watch them at low doses.</p> <p>12 You give them a large amount in -- a relatively large</p> <p>13 amount for a short period of time because the animal</p> <p>14 only lives, at most, for two years.</p> <p>15 So you have to kind of compensate for the fact</p> <p>16 that the animal will not live for a long time for them</p> <p>17 to develop long-term cancers or whatever, by giving</p> <p>18 them high doses in hoping of finding some sort of</p> <p>19 physiological change in a short period of time, and</p> <p>20 what that will be is the question.</p> <p>21 Q. Right. And one of the purposes of these</p> <p>22 tests, including Dr Drinker's test, was to determine at</p> <p>23 what dose workers could work safely with this material</p> <p>24 and at what dose over that level dangerous levels could</p> <p>25 arise, correct, sir?</p> <p style="text-align: center;">1406</p>

<p>1 A. They were hoping to establish a safe level of 2 exposure, yes.</p> <p>3 Q. All right. Now, let's take a step back. 4 Doctor, I want to hand you D-4186.</p> <p>5 THE COURT: It's already in evidence, right, 6 the Smyth article?</p> <p>7 MR. MILLER: Yes.</p> <p>8 Q. (By Mr. Miller) Doctor, and just for our 9 recollection, this is a report of a study by 10 Dr. Henry Field Smyth, M.D., Ph.D., from the University 11 of Pennsylvania, correct?</p> <p>12 A. At that point he was an assistant professor, 13 yes.</p> <p>14 Q. And the date of -- I'm sorry. Did you finish 15 your answer?</p> <p>16 A. Yes.</p> <p>17 Q. And the date of the study is 1931, correct?</p> <p>18 A. Yes.</p> <p>19 Q. And Dr. Smyth was conducting animal studies on 20 various compounds. Would you agree with that?</p> <p>21 A. Yes.</p> <p>22 Q. All right. And he was exposing animals to a 23 variety of compounds, mostly benzene containing 24 compounds; is that correct?</p> <p>25 A. Sort of a wide variety, a wide range of</p> <p style="text-align: center;">1407</p>	<p>1 one down talks about PCBs.</p> <p>2 A. Well, so does the first one. The first 3 paragraph also talks about PCBs.</p> <p>4 Q. Okay. All right.</p> <p>5 MR. MILLER: Go back to the first paragraph, 6 please.</p> <p>7 A. No.</p> <p>8 MR. MILLER: Sorry, Scott. Bottom left. 9 There you go.</p> <p>10 Q. (By Mr. Miller) Two chlorodiphenyl 11 preparations, C11H. Do you know what that is?</p> <p>12 A. H9Cl, I guess that is.</p> <p>13 Q. Okay. And that's a polychlorinated biphenyl?</p> <p>14 A. No. The second one is.</p> <p>15 Q. The first one is called monochlorodiphenyl?</p> <p>16 A. I'm sorry. These are mono. Yes, you put two 17 of them together, it would be bichlorinated.</p> <p>18 Q. So it's a monochlorobiphenyl were tested, and 19 both proved slightly toxic. Slightly, correct?</p> <p>20 A. Yes.</p> <p>21 Q. All right. "The 2-chloro compound killed in 22 from -- The next paragraph -- "20 to 40 hours in a dose 23 of 2.5 grams per kilo, with mild convulsions. And the 24 4-chloro compound killed in 40 hours in a dose of 25 3.5 grams per kilo, with no convulsions. Both were fed</p> <p style="text-align: center;">1409</p>
<p>1 compounds, some of which we may have considerable 2 information, but others that we don't know. That's all 3 I can tell you about it.</p> <p>4 Q. One of the compounds administered to the 5 laboratory animals in the study was polychlorinated 6 biphenyls, correct?</p> <p>7 A. Yes.</p> <p>8 Q. And the doses that Dr. Smyth administered to 9 the laboratory animals in connection with this study 10 were enormous. Would you agree with that?</p> <p>11 A. Well, if you'd point me where he says 12 enormous, but they obviously had to be high from what 13 you would normally -- At that point you wouldn't 14 normally come in contact with this material, so 15 whatever it would be, it would be high.</p> <p>16 Q. Well, as a matter of fact, doctor, Dr. Smyth 17 fed these animals the equivalent of four grams per 18 kilogram, correct?</p> <p>19 A. That's right.</p> <p>20 Q. So if you turn to page 93, it's got 5078 at 21 the bottom. You go to the right -- Well, down at the 22 bottom left it refers to diphenyls and diphenyl 23 derivatives, correct, on this section?</p> <p>24 A. Yes.</p> <p>25 Q. Okay. Go to the next paragraph. The second</p> <p style="text-align: center;">1408</p>	<p>1 in pastes as they were apparently insoluble. Here the 2 position of the chlorine atom seemed to govern the 3 degree of toxicity." All right?</p> <p>4 A. Yes.</p> <p>5 Q. The next paragraph actually refers to, doctor, 6 polychlorinated diphenyls. And in this paper it's 7 referred to as polychlorodiphenyls, correct? Those are 8 PCBs, correct?</p> <p>9 A. Well, all I can say is you're playing with 10 words. The fact is they're -- PCBs are often referred 11 to as chlorinated diphenyls in other documents that 12 you've shown me and that we've used. So we're talking 13 about one chlorinated diphenyl. And in this case over 14 here, one 4-chlorinated compound, which would be a 15 polychlorinated version of that.</p> <p>16 This second group is about two 17 polychlorinated diphenyls, the definite composition of 18 which were undecided, proved nontoxic. So they don't 19 know what those were. These above them, they do know, 20 and those caused convulsions.</p> <p>21 Q. These two polychlorinated diphenyls -- I'm 22 sorry -- polychlorodiphenyls, the definite compositions 23 of which were undetermined, proved nontoxic in doses of 24 4 grams per kilogram, correct?</p> <p>25 A. That's right.</p> <p style="text-align: center;">1410</p>

<p>1 Q. Four grams per kilogram would be the</p> <p>2 equivalent for you and me of over a cup of PCBs,</p> <p>3 correct?</p> <p>4 A. I guess if you multiplied your weight by</p> <p>5 4 grams per kilo, yes.</p> <p>6 Q. All right. So that is about feeding these</p> <p>7 animals a cup of PCBs, and in that case they proved</p> <p>8 nontoxic, correct?</p> <p>9 A. In that case, yes.</p> <p>10 Q. So Dr. Smyth is reporting to the scientific</p> <p>11 community that these two polychlorodiphenyls can be fed</p> <p>12 to these laboratory animals the equivalent of a cup of</p> <p>13 PCBs, and they would appear, at least in his test, to</p> <p>14 be nontoxic, correct, sir?</p> <p>15 A. Yes. The definite composition of which was</p> <p>16 undecided. That's what was distinguishing, what he</p> <p>17 says in this section which is called "Diphenyl and</p> <p>18 Diphenyl Derivatives." That's what he's</p> <p>19 distinguishing.</p> <p>20 Q. You've also referred in your testimony to a</p> <p>21 May 25, 1934 report of Dr. Frederick Flinn of patch</p> <p>22 tests made on natural -- material received from</p> <p>23 Swann Research, Incorporated, correct?</p> <p>24 A. Yes.</p> <p>25 Q. And the object of the investigation undertaken</p> <p style="text-align: center;">1411</p>	<p>1 Dr. Flinn here as dermatitis, correct?</p> <p>2 A. Yes.</p> <p>3 Q. And what we know that to be is a condition</p> <p>4 called chloracne?</p> <p>5 A. That's right.</p> <p>6 Q. Now, Swann went to Dr. Flinn because at the</p> <p>7 time he was a rather prominent figure in occupational</p> <p>8 health, correct?</p> <p>9 A. He was -- He had been known for lead research</p> <p>10 previously, and now he was working on this, yes.</p> <p>11 Q. But he was at some -- I don't know. What was</p> <p>12 the institution called? Columbia University?</p> <p>13 A. That's right.</p> <p>14 Q. No slouch, since you're a professor there</p> <p>15 yourself?</p> <p>16 A. That's right.</p> <p>17 Q. Swann at the time went to one of the foremost</p> <p>18 scientists from one of the most premier institutions in</p> <p>19 the world to learn about what was causing their workers</p> <p>20 to have this dermatitis, correct?</p> <p>21 A. Yes.</p> <p>22 Q. All right. And Dr. Flinn conducted what are</p> <p>23 called patch tests, correct?</p> <p>24 A. That's right.</p> <p>25 Q. And describe for the jury what a patch test</p> <p style="text-align: center;">1413</p>
<p>1 by Dr. Flinn was to determine what the cause of various</p> <p>2 dermatological conditions were that Swann was</p> <p>3 experiencing at that time?</p> <p>4 A. That was part of it, yes.</p> <p>5 Q. Well, he refers to a condition called</p> <p>6 chloracne, correct?</p> <p>7 A. Right. He says, "The object of this</p> <p>8 investigation was to determine whether or not the</p> <p>9 various chlorinated diphenyl compounds" -- Again, it's</p> <p>10 the same term they used in the previous document,</p> <p>11 chlorinated diphenyls -- "compounds submitted or some</p> <p>12 impurities contained therein might be the causative</p> <p>13 agent producing the dermatitis which had developed</p> <p>14 among some of the workmen in the plant." That's what</p> <p>15 the objective is.</p> <p>16 Q. So, again, Swann was the predecessor of</p> <p>17 Monsanto?</p> <p>18 A. Yes.</p> <p>19 Q. Swann was in Anniston, Alabama?</p> <p>20 A. Yes.</p> <p>21 Q. Anniston, Alabama is where Monsanto first</p> <p>22 started making PCBs, correct?</p> <p>23 A. Yes.</p> <p>24 Q. And in the 1930's, very early on, they had an</p> <p>25 outbreak of a dermatological condition described by</p> <p style="text-align: center;">1412</p>	<p>1 is.</p> <p>2 A. Well, basically it's taking a material and</p> <p>3 putting it on the skin, on the shaved part of the skin</p> <p>4 of a rabbit and taking it off after a short period of</p> <p>5 time and seeing whether there's any reaction on the</p> <p>6 skin.</p> <p>7 Q. Dr. Flinn used large white rabbits, correct?</p> <p>8 A. That's right.</p> <p>9 Q. And he conducted these tests for the purpose</p> <p>10 of determining if he could find out what was the cause</p> <p>11 of this chloracne, right?</p> <p>12 A. That's right.</p> <p>13 Q. And he --</p> <p>14 MR. MILLER: Scott, could you please go to the</p> <p>15 second page.</p> <p>16 Q. (By Mr. Miller) This lists, does it not, the</p> <p>17 various tests, and it goes on for a couple of pages,</p> <p>18 that Dr. Flinn conducted?</p> <p>19 A. Yes.</p> <p>20 Q. He used various substances and he used various</p> <p>21 mixtures of substances to try to determine what was the</p> <p>22 specific cause of the chloracne that was arising in the</p> <p>23 workers that were working in the PCB department at</p> <p>24 Swann?</p> <p>25 A. Yes.</p> <p style="text-align: center;">1414</p>

<p>1 Q. And he reached conclusions, did he not?</p> <p>2 A. Yes.</p> <p>3 Q. Would you turn to the last page. He writes in</p> <p>4 the second paragraph there, "One cannot feel that any</p> <p>5 styrene compound which may be found to be present as an</p> <p>6 impurity is the cause of your trouble." What he's</p> <p>7 referring to here is that at the time benzene was a</p> <p>8 primary compound used in the preparation of chlorinated</p> <p>9 biphenyl, correct?</p> <p>10 A. I guess so, yes.</p> <p>11 Q. And at the time Swann was receiving its</p> <p>12 benzene supply that was contaminated with styrene. And</p> <p>13 Dr. Flinn is reporting that it is the styrene</p> <p>14 contaminant in the PCBs or in the benzene that is</p> <p>15 causing these workers to develop their chloracne,</p> <p>16 correct?</p> <p>17 A. That's one line. You could read the first</p> <p>18 paragraph as well.</p> <p>19 Q. Sure. Let's read it all.</p> <p>20 MR. MILLER: Scott, would you blow up the</p> <p>21 first paragraph. Make it a little bigger, please.</p> <p>22 Q. (By Mr. Miller) "One is impressed with the</p> <p>23 fact that each of the aroclors giving a positive</p> <p>24 reaction were of a fluid nature. Attempts were made to</p> <p>25 expose the animals to vapors, but observations made us</p> <p style="text-align: center;">1415</p>	<p>1 In any event, he's saying it's the styrene</p> <p>2 impurity in your material that's causing your workers</p> <p>3 to have chloracne; is that right?</p> <p>4 A. He believes that. He feels that.</p> <p>5 Q. He was a toxicologist, preeminent, at Columbia</p> <p>6 University in the 1930's?</p> <p>7 A. Uh-huh.</p> <p>8 Q. A guy that you would want to go to if you had</p> <p>9 an occupational dermatologic problem at that time,</p> <p>10 correct?</p> <p>11 A. If you wanted to know about 24-, 48-hour patch</p> <p>12 tests, yes.</p> <p>13 Q. Did you see anywhere where Dr. Flinn</p> <p>14 recommended that Swann or, later, Monsanto, do any</p> <p>15 other kind of test?</p> <p>16 A. No.</p> <p>17 Q. You're familiar with a paper by Drs. Flinn and</p> <p>18 Jarvik. It's here, D-5848, Action of Certain</p> <p>19 Chlorinated Naphthalenes on the Liver?</p> <p>20 A. Yes.</p> <p>21 THE COURT: Is it in evidence?</p> <p>22 MR. JENSEN: It's in evidence as a plaintiff's</p> <p>23 exhibit, I believe, Your Honor.</p> <p>24 Q. (By Mr. Miller) Okay. And the date of this</p> <p>25 document is 1936; is that right?</p> <p style="text-align: center;">1417</p>
<p>1 conclude that the only difference was that the animal</p> <p>2 would be exposed to the hot material, and it was well</p> <p>3 known that the reaction where such an exposure is given</p> <p>4 is more severe."</p> <p>5 So he says we're not going to be exposing them</p> <p>6 to the vapors because there might be a problem, so</p> <p>7 we're not going to figure out what the cause of this</p> <p>8 chloracne is.</p> <p>9 A. Right.</p> <p>10 Q. Let's use the patch test, right?</p> <p>11 A. Yes.</p> <p>12 Q. But then he goes on. "One cannot feel" --</p> <p>13 "One cannot but feel that any styrene compound which</p> <p>14 may be found to be present as an impurity is the cause</p> <p>15 of your trouble. I was rather surprised that more of</p> <p>16 the compound submitted did not show or give reaction</p> <p>17 with the skin. It has been shown in some</p> <p>18 investigations that chlorine did not produce a</p> <p>19 dermatitis when metal like" --</p> <p>20 THE COURT: "Metallic."</p> <p>21 Q. (By Mr. Miller) -- "metallic" -- Thank you,</p> <p>22 Your Honor -- "electrodes were used, but did if the</p> <p>23 metallic electrodes were replaced by carbon electrodes.</p> <p>24 The theory was advanced that some organic chlorine</p> <p>25 compounds were produced in the latter case."</p> <p style="text-align: center;">1416</p>	<p>1 A. Again, I'm not sure. I believe that's right.</p> <p>2 Q. All right. And Drs. Flinn and Jarvik are also</p> <p>3 at the Columbia University, correct?</p> <p>4 A. Yes.</p> <p>5 Q. And they report that three cases of yellow</p> <p>6 atrophy of the liver have occurred in each of three</p> <p>7 widely separated plants and under different management</p> <p>8 within a year or two.</p> <p>9 Let's stop right here. What he's referring to</p> <p>10 in terms of these plants are plants owned and operated</p> <p>11 by a company called Halowax, correct?</p> <p>12 A. I believe so.</p> <p>13 Q. All right. And Halowax was a company that was</p> <p>14 manufacturing at the time wire coatings; is that right?</p> <p>15 A. Yes.</p> <p>16 Q. And the wire coatings that they were</p> <p>17 manufacturing were coatings that prevented wires from</p> <p>18 overheating and causing fires, correct?</p> <p>19 A. That's what I assume.</p> <p>20 Q. All right. And they were using a chemical</p> <p>21 called naphthalenes, correct?</p> <p>22 A. That's right.</p> <p>23 Q. Polychlorinated naphthalenes, right?</p> <p>24 A. That's right.</p> <p>25 Q. And they were also using PCBs in their</p> <p style="text-align: center;">1418</p>

<p>1 facilities, correct?</p> <p>2 A. I would assume so. He doesn't mention PCBs in</p> <p>3 this report. This is about naphthalenes, but I assume</p> <p>4 there were PCBs around there.</p> <p>5 Q. In any event, Drs. Flinn and Jarvik evaluated</p> <p>6 three cases of individuals who had a condition called</p> <p>7 yellow atrophy of the liver, correct?</p> <p>8 A. Yes.</p> <p>9 Q. Would you confirm for us that yellow atrophy</p> <p>10 of the liver, at least as you understand it from a</p> <p>11 position of historical -- history of science and</p> <p>12 medicine, that that is not cancer?</p> <p>13 A. It's a -- It's what it says. It's atrophy of</p> <p>14 the liver. It's not cancer.</p> <p>15 Q. It's not cancer.</p> <p>16 A. As it's defined here.</p> <p>17 Q. And these two researchers conducted</p> <p>18 evaluations of various chlorinated naphthalenes to</p> <p>19 determine what the cause of the yellow atrophy was</p> <p>20 among these workers; is that correct?</p> <p>21 A. That's right.</p> <p>22 Q. And they did animal experience -- experiments,</p> <p>23 correct?</p> <p>24 A. Yes.</p> <p>25 Q. And these experiments dosed these animals with</p> <p style="text-align: center;">1419</p>	<p>1 A. Yes.</p> <p>2 Q. So Drs. Flinn and Jarvik are saying, this,</p> <p>3 with the history of the industrial cases, points to its</p> <p>4 being -- chlorinated naphthalenes being a possible</p> <p>5 cause in these factory cases. No other materials used</p> <p>6 in the factory was found to produce a lesion", correct?</p> <p>7 A. That's what it says.</p> <p>8 Q. All right. Doctor, I want to hand you D-4574.</p> <p>9 You're certainly familiar with this paper. It is</p> <p>10 written by Dr. Cecil Drinker, Madeleine Warren,</p> <p>11 Granville Bennett. It's dated September 1937?</p> <p>12 A. Yes.</p> <p>13 MR. MILLER: Your Honor, this has previously</p> <p>14 been published as Plaintiff's 11-A.</p> <p>15 THE COURT: All right. Thank you.</p> <p>16 Q. (By Mr. Miller) This is the Drinker paper</p> <p>17 first published in 1937 that we've talked about -- you</p> <p>18 talked about yesterday with plaintiffs counsel and we</p> <p>19 mentioned a few minutes ago; is that right?</p> <p>20 A. Yes.</p> <p>21 Q. And this was published in the Journal of</p> <p>22 Industrial Hygiene and Toxicology, correct?</p> <p>23 A. That's right.</p> <p>24 Q. And at the time in 1937 this was a brand new</p> <p>25 industrial hygiene journal?</p> <p style="text-align: center;">1421</p>
<p>1 very, very high levels of chlorinated naphthalenes; is</p> <p>2 that right?</p> <p>3 A. Again, I'm sure they must have to get results</p> <p>4 in a short period of time.</p> <p>5 Q. In fact, they injected these rabbits with the</p> <p>6 naphthalenes?</p> <p>7 A. Yes.</p> <p>8 Q. And they concluded, did they not, that the</p> <p>9 substance responsible for the yellow atrophy of the</p> <p>10 liver among the three workers who suffered from it at</p> <p>11 Halowax was chlorinated naphthalenes. It doesn't</p> <p>12 mention PCBs at all, correct?</p> <p>13 A. It doesn't mention PCBs. It's a paper about</p> <p>14 naphthalenes.</p> <p>15 Q. Turn to page 120, last page. These test</p> <p>16 reports from the evidence obtained from 30 rabbits all</p> <p>17 show the same pathological picture. We feel that</p> <p>18 certain chlorinated naphthalenes or impurities</p> <p>19 contained within them are capable of producing yellow</p> <p>20 atrophy of the liver in the rabbits, correct?</p> <p>21 A. That's right.</p> <p>22 Q. This, with the history of the industrial</p> <p>23 cases, points to its being a possible etiologic agent</p> <p>24 in the factory cases. And etiology refers to cause,</p> <p>25 correct?</p> <p style="text-align: center;">1420</p>	<p>1 A. Well, it started in 1930 or thereabouts, '29</p> <p>2 or '30.</p> <p>3 Q. All right. It was in its infancy.</p> <p>4 Drs. Drinker -- And was it his brother, another</p> <p>5 Drinker?</p> <p>6 A. Phillip, yes.</p> <p>7 Q. And Phillip Drinker started this journal; is</p> <p>8 that right?</p> <p>9 A. Yes. That's essentially -- They're the</p> <p>10 editors, first editors.</p> <p>11 Q. And this became the premier journal of</p> <p>12 industrial hygiene and toxicology in the country during</p> <p>13 that era?</p> <p>14 A. It certainly was a major journal, yes.</p> <p>15 Q. All right. Drs. Drinker, Warren and Bennett</p> <p>16 were hired by the Halowax company, correct?</p> <p>17 A. Yes.</p> <p>18 Q. They were hired to follow up on the work by</p> <p>19 the researchers whose paper we just reviewed, Flinn and</p> <p>20 Jarvik; is that right?</p> <p>21 A. And, again, I'm not sure of the origins of it,</p> <p>22 but certainly they had a long-term interest in it, and</p> <p>23 this was another paper that -- or another group they</p> <p>24 asked to investigate it.</p> <p>25 Q. You need to keep your voice up.</p> <p style="text-align: center;">1422</p>

<p>1 A. I'm sorry. This was another group they asked 2 to investigate it. I'm not sure of the origins of how 3 they got to them.</p> <p>4 Q. Let's talk about Dr. Drinker. He started this 5 journal. It became the premier journal of industrial 6 hygiene and toxicology in the 1930's and '40s. And he 7 was a rather significant figure in the field of 8 industrial hygiene and physiology, correct?</p> <p>9 A. Yes.</p> <p>10 Q. In fact, he was --</p> <p>11 MR. MILLER: If you could blow that up, Scott.</p> <p>12 Q. (By Mr. Miller) He was at the Department of 13 Physiology, Harvard School of Public Health and the 14 Department of Pathology at the Harvard Medical School 15 in Boston, Massachusetts?</p> <p>16 A. Yes.</p> <p>17 Q. And you would agree with me, doctor, that if 18 you had a problem in your work force involving a 19 potential -- a potential exposure issue, this is the 20 guy, this is the group that you would want to go to for 21 advice?</p> <p>22 A. Well, it's certainly a very, very, very 23 respectable group, and I always like to go to them for 24 any kind of advice.</p> <p>25 Q. He was well known. He was well recognized.</p> <p style="text-align: center;">1423</p>	<p>1 injecting naphthalenes or PCBs into white rabbits, but 2 by exposing them to vapor, correct?</p> <p>3 A. I think it was both ingestion and vapor.</p> <p>4 Q. It was both ingestion and vapor. Let's talk 5 about the first test. The first test involved vapors; 6 is that correct?</p> <p>7 A. Well, I'm not sure it was the first test, but 8 certainly vapors were a part of the study.</p> <p>9 Q. Now, one of the interesting aspects of this 10 paper is that Drs. Drinker, et cetera described the 11 methods that they used in order to expose the animals 12 to the vapors of the materials they were exposing them 13 to, correct?</p> <p>14 A. That's right.</p> <p>15 Q. And they go through the trouble of explaining 16 that they had to heat these materials up to very, very 17 high temperatures just to get the vapors at a 18 sufficient concentration to expose the animals for the 19 purpose of the test?</p> <p>20 A. That's right.</p> <p>21 Q. And the reason they had to do that is because 22 these materials don't readily volatilize, correct, 23 doctor?</p> <p>24 A. I believe that they're pretty stable. I 25 believe that they -- I've since seen information that</p> <p style="text-align: center;">1425</p>
<p>1 He was considered an authoritative figure in the field 2 of occupational health and toxicology at the time?</p> <p>3 A. Yes.</p> <p>4 Q. And he was dean of the -- although it doesn't 5 say there, dean of the Harvard School of Public Health?</p> <p>6 A. That's correct.</p> <p>7 Q. And would you agree with me that this journal, 8 this Journal of Industrial Hygiene and Toxicology 9 was, as it was becoming the premier journal, widely 10 read by industrial, medical officers and directors in 11 major companies around the country?</p> <p>12 A. I would assume that it was widely read by 13 toxicologists and people who were in charge of medical 14 issues at various corporations. I'm not sure that the 15 executives read it or not or depended upon their 16 medical personnel to get this information, but 17 certainly it was a widely distributed journal.</p> <p>18 Q. And, again, Drs. Drinker, Warren and Bennett 19 were looking at the issue of yellow atrophy of the 20 liver in these Halowax workers, correct?</p> <p>21 A. That's right.</p> <p>22 Q. Now, these researchers also conducted animal 23 experiments?</p> <p>24 A. Yes.</p> <p>25 Q. They conducted animal experiments not by</p> <p style="text-align: center;">1424</p>	<p>1 they may volatilize very, very slowly. I just can't 2 really answer that very specifically. I think that, 3 you know, in general you have to heat them pretty high 4 to get any kind of significant volatilization.</p> <p>5 Q. Let's talk about volatility. Volatility is a 6 very simple concept that expresses the degree to which 7 a substance like a liquid is going to evaporate, 8 correct?</p> <p>9 A. Well, evaporate or go into the air.</p> <p>10 Q. Go into the air. Okay. That's an even 11 simpler term. For example, alcohol or acetone goes 12 into the air very, very rapidly, correct?</p> <p>13 A. That's right.</p> <p>14 Q. We call that rapid volatilization, correct?</p> <p>15 A. Some people do.</p> <p>16 Q. Water will volatilize. If I have a cup of 17 water about this size, open up the top, in about a day 18 or so, maybe two, the water is going to completely 19 evaporate, correct?</p> <p>20 A. Yes.</p> <p>21 Q. If I have an Aroclor 1242, 1254, 1268, 1262, 22 and I put it here, tomorrow I'm going to have just 23 about the same amount?</p> <p>24 A. Just about, yes.</p> <p>25 Q. Because it volatilizes very, very slowly,</p> <p style="text-align: center;">1426</p>

1 correct?

2 A. That's right.

3 Q. And if I come back in a week, I'm going to
4 have just about the same amount that I left here,
5 correct?

6 A. Probably.

7 Q. And if I come back in a month or two or a
8 year, it's pretty much going to be the same as the
9 amount that I left on the table, correct?

10 A. That I can't attest to, but it's very stable.

11 Q. Very stable. It volatilizes very, very
12 slowly, and that's why these doctors had to heat this
13 material up to extraordinarily high temperatures, just
14 to expose the animals?

15 A. That's right.

16 MR. MILLER: Your Honor, did you want to take
17 a break at this time?

18 THE COURT: We'll take a short recess. The
19 admonition about not talking about the case is in
20 effect.

21 (A recess was taken.)

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